

What is Claimed is:

1. A multi lumen catheter comprising an inner tube having a front tip, an outer tube, a tube or lumen for inserting a guide wire, a blood extraction lumen and a blood return lumen which are formed in the outer tube and the inner tube respectively or both in the outer tube, wherein the inner tube is inserted in the outer tube, and allowed to slide relative to the outer tube, and the front tip is jointed to the front end of the outer tube to shut off the communication of the blood extraction lumen and the blood return lumen from the exterior of the catheter.

2. A multi lumen catheter 1 comprising:

an outer tube 2 having an inner cavity constituting a blood extraction lumen 21, and a blood extraction port 22 which is open at an end facing the front end side in the axial direction and communicates said blood extraction lumen 21 with the exterior of the catheter 1;

an inner tube 3 having (a) an inner cavity constituting a blood return lumen 31 and (b) a blood return port 32 for communicating said blood return lumen 31 with the exterior of the catheter 1; and

a tube 4 for inserting a guide wire and having (a) an inner cavity constituting a lumen 41 for inserting the guide wire, and (b) a front tip 42 of a tapered shape;

wherein said inner tube 3 and tube 4 are inserted in said outer tube 2, and are allowed to slide relative to said outer tube 2, and the front tip 42 slides with said tube 4 between a

first open position and a second closed position and in said second closed position is joined to the front end of said outer tube 2 to shut off communication of said blood extraction lumen 21 and said blood return lumen 31 from the exterior of the 5 catheter 1.

3. A multi-lumen catheter 1 comprising:

an outer tube 2 having an inner cavity constituting a blood extraction lumen 21 and a blood return lumen 31, a blood extraction port 22 which is open toward the front end side in the axial direction and communicates said blood extraction lumen 31 with the exterior of the catheter, and a blood return port 32 which is open toward the front end side in the axial direction on the front side of said blood extraction port 22 and 10 communicates said blood return lumen 31 with the exterior of the 15 catheter 1; and

an inner tube 4 having (a) an inner cavity constituting a lumen 41 for inserting a guide wire and (b) a front tip 42 of a tapered shape;

wherein said inner tube 4 is inserted in said outer tube 2, and is allowed to slide relative to said outer tube 2, and the front tip 42 slides with said tube 4 between a first open position and a second closed position and in said second closed position is joined to the front end of said outer tube 2 to shut 20 off the communication of said blood extraction lumen 21 and said 25 blood return lumen 31 from the exterior of the catheter 1.

4. A multi lumen catheter 1 comprising:

an outer tube 2 having a front end and a base end, an inner cavity constituting a blood extraction lumen 21, and a blood extraction port 22 which is open at an end facing the front end side in the axial direction and communicates said blood extraction lumen 21 with the exterior of the catheter 1;

5 an inner tube 3 having an inner cavity constituting a blood return lumen 31 and a blood return port 32 for communicating said blood return lumen 31 with the exterior of the catheter 1; and

10 a tube 4 for inserting a guide wire and having (a) an inner cavity constituting a lumen 41 for inserting the guide wire, and  
15 (b) a front tip 42 of a tapered shape;

wherein said inner tube 3 is at least partly secured to said tube 4 for inserting the guide wire, said inner tube 3 and said tube 4 for inserting the guide wire are inserted in said outer tube 2 and are slid able relative to said outer tube 2 between a first open position and a second closed position such that, in said first open position, said outer tube 2, said inner tube 3 and said tube 4 for inserting the guide wire are in such an order that the front tip 42, the blood return port 32 and the blood extraction port 22 are successively arranged in order from the front end side, and the blood extraction lumen 21 with the blood extraction port 22 and the blood return lumen 31 with the blood return port 32 communicate with the exterior of the catheter 1, and, in said second closed position, the front tip 42 of said tube 4 for inserting the guide wire is joined to the front end of said outer tube 2, and the communication of said blood extraction lumen 21 and said blood return lumen 31 from the exterior of the catheter 1 is shut off.

5. The multi lumen catheter according to claim 4, wherein  
the blood extraction lumen 21 in the blood extraction port 22 and  
the blood return lumen 31 in the blood return port 32 communicate  
with the exterior of the catheter 1 in said first open position  
when the dialysis is being conducted, and the communication of  
said blood extraction port 22 and said blood return port 32 from  
the exterior of the catheter 1 is shut off in said second closed  
position when the dialysis is not being conducted.

10 6. The multi lumen catheter 1 according to claim 4,  
wherein said inner tube 3 and said tube 4 for inserting the guide  
wire are independent from each other.

15 7. The multi lumen catheter 1 according to claim 4,  
wherein said inner tube 3 and said tube 4 for inserting the guide  
wire share a wall over the full length of said inner tube 3.

20 8. The multi lumen catheter 1 according to claim 4,  
wherein said tube 4 for inserting the guide wire is inserted in  
said inner tube 3.

9. The multi lumen catheter 1 according to claim 4,  
wherein said inner tube 3 and said tube 4 for inserting the guide  
wire are secured to each other at base end portions thereof.

25 10. The multi lumen catheter 1 according to claim 4,  
wherein said inner tube 3 is secured at its front end to the  
front tip 42 of said tube 4 for inserting the guide wire.

11. The multi lumen catheter 1 according to claim 4, wherein said blood return port 22 in said inner tube 3 is open at an end facing the front end side in the axial direction.

5 12. The multi lumen catheter 1 according to claim 4, wherein said blood return port 22 in said inner tube 3 is a side port opening in the side surface of said inner tube 3.

10 13. The multi lumen catheter according to claim 4, further comprising a locking mechanism for locking the arrangement of the outer tube 2, inner tube 3 and tube 4 for inserting the guide wire in said first open position.

15 14. The multi lumen catheter 1 according to claim 4, further comprising a locking mechanism for locking the jointing of the front tip 42 of said tube 4 for inserting the guide wire and said outer tube 2 in said second closed position.

20 15. The multi lumen catheter according to claim 4, wherein said tube 4 for inserting a guide wire having an inner cavity constituting a lumen 41 for inserting the guide wire and a front tip 42 of a tapered shape further comprises a communication shut-off mechanism 44 capable of shutting off communication between the lumen 41 for inserting the guide wire and the exterior of the 25 catheter 1.

16. A multi lumen catheter 1 according to claim 15, wherein said inner tube 3 and said outer tube 2 share a wall.

17. A multi lumen catheter 1 according to claim 15, wherein  
said tube 4 for inserting the guide wire is inserted in the blood  
extraction lumen 21 of said outer tube 2.

5 18. A multi lumen catheter 1 according to claim 15, wherein  
said tube 4 for inserting the guide wire is inserted in said  
inner tube 3.

10 19. A multi lumen catheter 1 according to claim 15, wherein  
the inner cavity of said outer tube 2 is further provided with  
a lumen in which can be inserted said tube 4 for inserting the  
guide wire.

15 20. A multi lumen catheter 1 according to claim 15, wherein  
said blood return port 21 in said inner tube 3 is a side port  
opening in the side surface of said inner tube 3.

20 21. A multi lumen catheter 1 according to claim 15, wherein  
said blood return port 21 of said inner tube 3 is open at an end  
facing the front end side in the axial direction.

25 22. A multi lumen catheter 1 according to claim 15, wherein  
the joint between said front tip 42 and said outer tube 2 is  
formed on a plane that meets the long axis of said multi lumen  
catheter at right angles.

23. A multi lumen catheter 1 according to claim 15, wherein  
the joint between said front tip 42 and said outer tube 2 is

formed on a plane that meets the long axis of said multi lumen catheter at an obtuse angle.

24. A multi lumen catheter 1 according to claim 15, further  
5 comprising a locking mechanism for holding said outer tube 2,  
said inner tube 3 and said tube 4 for inserting the guide wire  
in said first open position where communication has not been shut  
off in said blood extraction port 22 and in said blood return  
port 32.

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25. A multi lumen catheter 1 according to claim 15, further  
comprising a locking mechanism for holding said outer tube 2,  
said inner tube 3 and said tube 4 for inserting the guide wire  
in said second closed position where communication has been shut  
15 off in said blood extraction port 22 and in said blood return  
port 32.

26. A multi lumen catheter 1 comprising:  
an outer tube 2 having a front end side and a base end side,  
20 an inner cavity including a blood extraction lumen 21 and a blood  
return lumen 31, a blood extraction port 22 which is open toward  
the front end side in the axial direction and communicates said  
blood extraction lumen 31 with the exterior of the catheter, and  
a blood return port 32 open toward the front end side in the  
25 axial direction on the front end side of said blood extraction  
port 22 and communicates said blood return lumen 31 with the  
exterior of the catheter 1; and  
an inner tube 4 having (a) an inner cavity constituting a

lumen 41 for inserting a guide wire and (b) a front tip 42 of a tapered shape;

wherein said inner tube 4 is inserted in said outer tube 2, and is slidably relative to said outer tube 2 between a first open position and a second closed position such that, in said first open position, said outer tube 2 and said inner tube 4 are in such an order that the front tip 42, the blood return port 32 and the blood extraction port 22 are successively arranged in order from the front end side, and the blood extraction lumen 21 with the blood extraction port 22 and the blood return lumen 31 with the blood return port 32 communicate with the exterior of the catheter 1, and in said second closed position the front tip 42 of said inner tube 4 is joined to the front end of said outer tube 2, the communication of said blood extraction lumen 21 and said blood return lumen 31 from the exterior of the catheter 1 is shut off.

27. A multi lumen catheter 1 according to claim 26, wherein said inner tube 4 is inserted in the blood extraction lumen 31 of said outer tube 2.

28. A multi lumen catheter 1 according to claim 26, wherein said inner tube 4 is inserted in the blood return lumen 31 of said outer tube 2.

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29. A multi lumen catheter 1 according to claim 26, wherein the inner cavity of said outer tube 2 is further provided with a lumen for inserting said inner tube 4, and said inner tube 4

is inserted in said lumen for inserting the inner tube.

30. A multi lumen catheter 1 according to claim 26, further comprising a locking mechanism for holding said outer tube 2 and  
5 said inner tube 4 in said first open position where communication has not been shut off in said blood extraction port 22 and in said blood return port 32.

31. A multi lumen catheter according to claim 26, further comprising a locking mechanism for holding said outer tube 2 and  
10 said inner tube 4 in said second closed position where communication has been shut off in said blood extraction port 22 and in said blood return port 32.

15 32. A multi lumen catheter (C) with balloon comprising:  
a base end portion (51);  
a flexible tubular main body (52) extending from the base end portion (51) to a front end portion;  
20 a front tip (53) having an outer shape tapered toward the front end which is provided at a front end of the tubular main body (52);  
a balloon (12) provided on outer side of the tubular main body (52) at a portion close to the front tip (53) but on the base end portion (51) side of the front tip (53), and having an  
25 outer diameter, when it is deflated, smaller than a maximum outer diameter of the front tip (43);  
a blood return port (81) of a blood return lumen (13) and a blood extraction port (71) of a blood extraction lumen (14)

formed in the tubular main body (52) on opposite sides of the front tip (53); and

an outer tube (50) slidably arranged on the outermost side of said tubular main body (52) so as to slide in the lengthwise direction of said body (52) between a first open position and a second closed position,

wherein the blood extraction port (71), the blood return port (81) and said balloon are closed when the end of the outer cylinder (50) in said second closed position is in contact with the front tip (53).

33. The multi lumen catheter with balloon according to claim 32, wherein said tubular main body (52) is so formed that said outer cylinder (50) also serves as an outer wall of the blood extraction lumen (14).

34. The multi lumen catheter with balloon according to claim 32, wherein said tubular main body (52) has a lumen (15) for a guide wire penetrating said tubular main body (52) from said base end portion through to the front tip (53).

35. The multi lumen catheter with balloon according to claim 32, wherein the blood return lumen (13) also serves as a lumen for a guide wire.

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36. The multi lumen catheter with balloon according to claim 32, wherein said tubular main body (52) is provided with a lumen for flowing a gas or a liquid for inflating and deflating

said balloon.